NEW PALAEARCTIC GEOMETRIDAE.

By LOUIS B. PROUT.

SUBFAM. STERRHINAE

1. Sterrha aversata indeviata subsp.n.

♂, 29–30 mm. Ground-colour as in the palest forms of *a. aversata* Linn. ——*Forewing* with median line anteriorly straight, almost as oblique as termen, crossing the cell-dot; postmedian much less bent than in *a. aversata*; no band between median and postmedian.——*Hindwing* with median line straight, or almost so, considerably proximal to the cell-dot.——In addition, the termen of both wings is slightly more sinuous than in most *aversata*.

Algeria: Hammam Rirha, 19–23 June 1916 (V. Faroult), type in coll. Tring Mus. Tunis: Ain Draham, 6–19 August 1911 (V. Faroult), 2 ♂♂ in the same collection.

SUBFAM. LARENTIINAE

2. Ecliptopera mactata placata subsp.n.

♂♀. Distinguished from *m. mactata* Feld. (1875, Japan) as follows: *Forewing* with the antemedian white line bilobed rather than biangulate, the projections being shorter and blunter, usually well separated from the median; postmedian with the central prong looking broader, being as near the termen behind M^1 as before it, faintly incurved at M^1; subterminal formed of conspicuous white spots.——*Hindwing* with the postmedian more proximal anteriorly, more direct from costa to M^2, sharply outbent to fold.

China, very widely distributed, the type ♂ from Ningpo, July 1886 (native collector) in coll. Tring Mus., together with a specimen from "West China." I have it from Wenchow and Kiukiang, the British Museum from Moupin, the Hill Museum from Hunan, Central China, 4 examples.

3. Earophila semna sp.n.

♀, 42 mm. Best comparable with *Coenotephria* (?) *malvata* (Ramb.), but on the present tentative system of classification an *Earophila* (*vide L'Amat. Papil.* iii. 222, No. 16, where—as is shown by the context—"avant" is a misprint for "après"). Wings even broader than in the species named, the forewing having the costal margin more shouldered at the base, the hindwing the termen slightly more convex. Face without cone. Palpus nearly $1\frac{1}{2}$. Antenna pubescent. Head and body concolorous with wings.

Forewing with termen markedly crenulate, except between apex and R^1; glossy russet, somewhat dulled by dark dots on the veins, especially in the areas on either side of the central; basal area slightly more tawny; apical dash short and weak, hardly more oblique than termen; cell-dot enlarged into a small spot, indistinctly ocellated; lines grey (dark gull-grey to slate-grey), with a tinge of blue; subbasal as in *malvata* or slightly more excurved; antemedian rather indistinct, about as in *malvata*; rounded median spots best developed posteriorly; postmedian proximally very finely white-edged from

costa to near R^1, more broadly dark-edged between the radials (here inbent) and again behind M^3, very weak and not greatly projecting between R^3 and M^2; subterminal paler from costal margin to SC^4, then weak, very near termen; terminal line indistinct, interrupted by minute whitish vein-dots; fringe with pale basal line very fine.——*Hindwing* with the tooth at M^1 longest; DC strongly biangulate; colour as in *C. malvata* or dark *E. badiata* (Schiff.); a small blackish cell-dot; postmedian line brown, fairly distinct, with a strong outward curve culminating at the medians; terminal line and fringe as on forewing.

Underside browner than in *malvata*, more glossy, a great part of the forewing (except anteriorly) weakly marked and slightly more vinaceous; both wings with cell-dot, postmedian line (that of forewing weak) and fine terminal line; some other markings indicated, especially—on hindwing and anterior part of forewing—a narrow pale band outside the postmedian and double series of dark subterminal vein-dots, somewhat recalling a *Triphosa*.

Algeria: Hammam-Meskoutine, 2 February 1911 (W. Rothschild and E. Hartert), type in coll. Tring Mus.

4. **Carige cruciplaga debrunneata** subsp.n.

♂♀. Colour grey, less brown-tinged than name-typical *cruciplaga* Walk. (1861),[1] the wings slightly more angular, the excision in the termen of the hindwing generally appreciably deeper; the black markings which accompany the postmedian less variable than in *C. cruciplaga*, more uniform, scarcely ever much enlarged.

W. China, fairly common, the type from Pu-tsu-fu, 8,000–10,000 feet, July 1890, in coll. Tring Mus.

Unfortunately the specimen figured in Seitz, *Macrolep.* iv, t. 7 f., as *duplicaria*, belongs to this race and not to that of E. China; it is a ♂ from Omei-shan in coll. L. B. Prout.

Subfam. **GEOMETRINAE**

5. **Erannis miracula** sp.n.

♂, 44 mm. Considerably larger than *leucophaearia* Schiff. and its Japanese race *dira* Butl. (1878). Palpus scarcely so minute, though shorter than in *bajaria* Schiff.; tongue slight, as in those species. Antenna similarly pectinate, but with only two or three apical segments non-pectinate.

Forewing much broader than in *leucophaearia*, with costal margin more rounded; SC^1 short-stalked with SC^2, anastomosing with C; DC^2 longer than DC^3, its hinder part (behind the cell-fold) somewhat oblique outward, DC^3 again vertical; light brown, with cloud between postmedian and subterminal more as in *bajaria* than in *leucophaearia*, markings approximately as in *leucophaearia*; median line well developed, nearly straight; postmedian with its sinuses rather shallower than in *leucophaearia*, the second outward one at or behind, not in front of, M^2; subterminal nowhere enlarged into spots, its anterior half strongly dentate, its posterior slightly thicker and less deeply dentate.——*Hindwing* ample, recalling that of *defoliaria* Cl.; C anastomosing with SC for a good distance at middle of cell; cell-dot strong, the vague line from it to

[1] "Penang" must be an erroneous locality; the type, though in poor condition, seems clearly to belong to the collective species *duplicaria* Walk. (1862) = *nigronotaria* Brem. (1864), apparently the Japanese form. No Malayan material is yet known in the group.

abdominal margin at least as straight as in any *leucophaearia*, without the outward bend and thickening at its posterior end which characterizes *l. dira*.

Tokio, 22 February 1891 (Fritze), 2 ♂♂ in coll. Tring. Mus., the paratype labelled "Oaji" (?)—somewhat illegible and no such name traceable, but as both were taken on the same day it must be in the neighbourhood of Tokio.

The peculiarities of venation (biangulation of DC of forewing and especially anastomosis of C of hindwing) might suggest the need for a new genus, but *Erannis* is notoriously unstable in venation and there can be no doubt whatever as to the general affinities of *miracula*. I have seen *E. defoliaria* with DC of the *hindwing* biangulate ; the subcostals of the forewing are in both the *miracula* as in the very great majority of *E. marginaria* Fb. and *aurantiaria* Hb.

6. **Erannis ectroma** sp.n.

♂, 47 mm. Head and thorax above orange-buff, the rest of the body somewhat less bright. Antennal structure about as in *defoliaria* Cl. or with the fascicles scarcely so long.

Forewing slightly broader than in *defoliaria*, the termen with a similar, or somewhat more pronounced, concavity between R^3 and fold ; SC^2 out of SC^1 near its base, slightly curved at its origin, exactly as in a specimen of *E. ankeraria* (Stgr.) before me ; rather pale orange-yellow, irrorated with brownish drab, perhaps least strongly on the median area, or especially between the median and the postmedian line ; antemedian line of a similar drab, slightly curved anteriorly, then straight, attended by a dusky suffusion proximally ; postmedian darker, rather firm, arising from costa 5 mm. from apex, oblique outward to C, then oblique inward, though slightly less so than termen, with a similar gentle inward curve in its middle part, 4 mm. from termen at SM^2, somewhat incurved at hindmargin, a narrow shade outside it indicated by a slight reddening of the ground-colour ; a weaker median line, slightly nearer to ante- than to postmedian, arising from a costal diffusion ; fringe unspotted.——*Hindwing* as in *defoliaria*, but rather more rounded apically.

Forewing beneath similar but rather duller ; hindwing more irrorated than above and with traces of curved postmedian line.

S. Ussuri : Anutshino, 100 km. from Nikolsk, June 1908. Type in coll. Tring Mus.

This must be near to *jacobsoni* Djakonov (*Ann. Mus. Zool. Ac. Sci. U.R.S.S.* xxvii. 223), possibly a local race of it. According to its author's careful description, *jacobsoni* must differ in its more produced apex, paler forewing, especially at termen, differently formed postmedian line, etc. The genitalia, so far as can be made out without dissection, favour *jacobsoni* ; at least the ventral margin of the valva follows a closely similar course. The unique type of *ectroma* is asymmetrical, the right forewing being slightly undersized and with distorted venation and lacking the cell-spot both above and beneath.

7. **Cleora aechmeëssa** sp.n.

♂, 30 mm. ; ♀, 38 mm. Face and palpus blackish fuscous, the palpus little over 1, with second joint moderately rough-scaled, third quite small. Antenna in ♂ shortish, with rather long, moderately stout pectinations, the last 7 joints merely ciliate ; in ♀ nearly simple. Fillet and crown whitish, with

some irroration. Thorax and abdomen eoneolorous with wings, the abdomen dorsally with traees of paired dark spots. Legs predominantly pale; hindtibia of ♂ not or searcely dilated, apparently without hair-pencil.

Forewing with termen smooth, gently rounded, moderately oblique; SC^1 from SC^2 near its base, anastomosing with C; fovea in ♂ strong; dull white, eopiously irrorated with grey-brown, the ♀ only slightly whiter than the ♂—coloration about as in *Boarmia punctinalis* (Scop.) or *Aethalura punctulata* (Schiff.) ♀; antemedian line sharply angled close to eosta, exeurved in cell, rather oblique inward to hindmargin, with slight indentation on M; cell-mark elongate but weak, espeeially in the ♂; median shade marked by a heavy eostal spot opposite the eell-mark and a smaller spot or dot at base of M^2, otherwise weak, sinuous; postmedian rather nearer to cell than to termen, nearly parallel with the latter exeept in front of R^1, where it reeedes slightly; shallowly (at fold deeply) lunulate inward between the veins and with blaek teeth outward on the veins, on SC^5 rather thiek, on R^2 small, on SM^2 moderate, on the four prineipal veins sharp; the succeeding band-like grey-brown shading irregular, broadest and strongest between R^3 and M^2; the white subterminal dentate, not very eonspieuous, but with the usual proximal dark shading between the radials (here confluent), at costa, and between fold and tornus; terminal dots strong, subtriangular; fringe pale, weakly marked.——*Hindwing* with termen rounded, waved; cell-mark obsoleseent; a rather weak median line, eurved outward at abdominal margin; postmedian of forewing continued, strongly oblique outward behind the submedian lunule; markings of distal area rather weak but more regular than on forewing; similar terminal dots and fringe.

Both wings beneath with cell-mark (on hindwing rather broad), postmedian line (less blaek than above) and traees of the other markings, notably the mid-eostal spot of forewing.

Japan: Chusendji Lake, above Nikko, 3 September 1910 (E. A. Coekayne), type and allotype in coll. L. B. Prout, kindly presented by Dr. Coekayne. I have diseovered 1 ♀ from Tokio in the British Museum eollection mixed with *leucophaea* Butl. (!), but know of no other examples. In strueture it is near *obliquaria* (Motseh.) auett., but in aspeet it much more recalls an *Ectropis* or the South African *Boarmia ectropodes* Prout (1913). Probably nearest to *Cleora simpliciaria* (Leeeh, 1897), palpus shorter, wings slightly broader, forewing with anastomosis of SC^1 stronger, postmedian line less bent, ete.

8. **Gnophos variegata rothschildi** subsp.n.

♂, 24 mm. Distinguished by its small size, typieally orange-einnamon ground-eolour, and eopious blaekish strigulation, only leaving the brighter eolour at all obvious in parts of the median area. Hindwing with the termen only feebly erenulate. Underside less sharply marked than in most forms of the speeies.

Maroeeo: Tedders, Upper Bou-Regreg, 19 April–1 May 1924 (E. Hartert & F. Young), type in eoll. Tring Mus.; Djebel Chedar, 16 hours S.E. of Mazagan, end of February 1902 (W. Riggenbaeh), 1 ♂, worn, also in coll. Tring Mus.; Mrassine, Mareh–May 1921 (H. Powell), a good series in eoll. Brit. Mus., ex eoll. Oberthür.

The Tedders example is reeorded by Lord Rothsehild (*Bull. Soc. Sci. Nat. Maroc*, v. 147, 1925) as *Gnophos variegata* Dup. It is, as he noticed, extraordinarily like some dark forms of *mucidaria ochracearia* Stgr. except in the

build of the antenna ; the Mrassine series shows moderate variation, but lacks the sharp colour-contrasts of *v. variegata*.

Zernyia gen.n.

Face not protuberant, appressed-scaled. Palpus short, shortly rough-scaled beneath. Tongue short. Antenna less than one-half length of forewing, in ♂ bipectinate to apex or almost, with long branches, in ♀ sometimes shortly bipectinate. Pectus somewhat hairy. Foretibia without claw. Hindtibia not dilated, all spurs developed. Abdomen in ♂ slender, in ♀ moderately robust. Wings in both sexes fully developed ; frenulum and retinaculum normal.——*Forewing* with termen moderately oblique, waved, gently curved ; cell ½, DC normal ; SC^1 and SC^2 free, from cell, or occasionally shortly stalked, M^1 well separate from R^3.——*Hindwing* with costal margin moderately long, termen subcrenulate in anterior half ; cell ½ or nearly ; C approximated to SC to about middle of cell, rapidly diverging, SC^2 separate, R^2 wanting, M^1 well separate.

Type of the genus : *Zernyia enconistoides* (Zerny) = *Gnophos enconistoides* Zerny (1927).

Differs from *Dyscia* in the shape, the less aborted tongue and other details, from *Enconista* in the absence of foretibial claw and of fovea, from *Sclidosema* in absence of fovea, reduction of tongue and continuation of the antennal pectinations virtually to the apex, from *Gnophos* in the stronger pectinations (sometimes also transferred to the ♀), the non-protuberant frons and reduction of tongue. The genitalia lack the costal arm of the "*Gnophinae*" of Pierce (approximately equivalent to the genus "*Crocota*" of Meyrick), but have an extended "costa," strongly spined distally, blunt uncus, and stout aedeagus.

9. Zernyia selidosema sp.n.

♂♀, 35–40 mm. Differs from *enconistoides* Zerny, from Spain, in having the pectinations of the ♂ antenna longer, but with 2 or 3 segments non-pectinate, the ♀ antenna less strongly dentate.——*Forewing* with slight indications of a fovea ; ground-colour less pure grey, more drab or tinged with avellaneous ; irroration less coarse ; postmedian line (row of dots) rather more distally placed ; macular band between postmedian and subterminal less complete, variable, in the type ♂ and the allotype strongest between the radials and posteriorly, in the second ♂ almost obsolete.——*Hindwing* with the postmedian less proximal than in *enconistoides*.

Algeria : Glaciers de Blida, 12 August 1907, type ♂, 15 September 1911, 1 ♂, both in coll. Tring Mus. ex coll. Capt. Holl, together with a ♀ from the same collection, without locality label.

The genitalia, so far as can be made out without dissection, differ very little from those of *enconistoides*, but apparently the valva has the costal part of the costa rather less strong and lacking the first projection, though both agree in having a central tooth or small prong.

10. Zernyia gnophoides sp.n.

♂♀, 36–40 mm. Pectinations of ♂ antenna about as long as in *Z. selidosema* (*supra*) but continued to apex ; ♀ antenna also pectinated, except apically, the longest branches about 2. At least as *Enconista*-like as the genotype, but

perhaps also comparable, as Oberthür assumed, to *Gnophos crosi* Th.-Mieg (= *omararia* Oberth.) or rather to some forms of *Gn. mucidaria ochracearia* Stgr., the whitish ground-colour being tinged with flesh-colour or vinaceous-pink, especially costally, the grey (in some aspects slightly olivaceous) irroration exceedingly dense and interspersed with blackish scales, the cell-spots above and beneath enlarged (at least on forewing; on hindwing often obsolescent above), vaguely ocellated, all three lines arising on the forewing from blackish costal spots, the median line very weak, rather variable in position, the post-median placed about as in *enconistoides*, generally rather better developed; distal area without conspicuous darkening, except occasionally on underside.

Algeria: Aflou, Oran, 3 October 1911, type ♂ and allotype ♀ in coll. Tring Mus., ex coll. Holl. Also a long series from Aflou, September 1911 (H. Powell) from Oberthür in coll. Brit. Mus., labelled "*Gnophos* ? *omararia* ? (spec. ?)," and 1 ♀ from Géryville, September 1910 (H. Powell).

In the allotype ♀ and a few other examples SC^1 and SC^2 of the forewing are shortly stalked; occasionally, also, SC^1 anastomoses at a point with C.

11. **Zernyia annularis** sp.n.

♂♀, 36–40 mm. Structure about as in the preceding, forewing slightly longer and narrower, its straightish or subsinuate costa sometimes recalling a *Dyscia*. Ground-colour with similar fleshy tinge to that of *gnophoides*, irroration much less dense, except in the distal area, where the cloudings, in strongly-marked specimens, resemble those of *enconistoides*; cell-marks further enlarged, especially on forewing, where a definite ring is formed (sometimes filled-in on the underside); costal spots undeveloped, though one strongly-marked ♀-ab. shows a blurred one just proximal to the cell-spot; apex of forewing pale. Underside characteristic, paler than upper, not or scarcely irrorated, lines obsolete, cell-spots or rings on both wings strong, subterminal shades strong, in places extended to termen, forewing with a sharply whitish, quadrate apical spot, which is usually well isolated from the rest of the pale terminal shading.

Algeria; Metlili, N. of Laghouat, 4–6 September 1917 (V. Faroult), 2 ♂♂, 3 ♀♀ in coll. Tring Mus.

The subcostal venation of the forewing is somewhat variable; in 1 ♂, SC^1 and SC^2 are shortly stalked, in 1 ♀ SC^1 anastomoses with C.

A slightly shorter-winged form from Batna (A. Nelva) measures 34 mm. and has the upper surface rather more uniformly irrorated, the under with the subterminal shades less strong, on the hindwing evanescent, and suggests a possibility that *annularis* may prove a local modification of *gnophoides*. I propose for it the name of **Zernyia annularis nelvai** subsp.n. 3 ♂♂ in coll. Tring Mus. It superficially recalls *Enconista amoritaria* Püng. (1902).

12. **Siona galactica** sp.n.

♂, 46 mm. Head and front of thorax cream-colour to Naples yellow. Palpus more uniformly clothed than in *lineata* Scop.; ochraceous tawny, the projecting hair of 1st joint paler. Antenna and forecoxa ochraceous tawny.

Forewing with costa appreciably less arched near base than in *lineata*; very pale cream-yellow, entirely without markings, only the strongest veins (M and the proximal part of its branches) faintly browner.——*Hindwing* white, unmarked, at apex and part of termen faintly tinged with cream-yellow.

Underside very pale cream-yellow, the forewing becoming white behind M and M^2 and with a strong suffusion of dirty greyish red-brown in cell and on veins R^3, M^1, and M^2; traces of a slightly darker cell-dot also discernible on forewing.

Algeria: Souk-Ahras, 13 and 14 April 1914, type and another, both in Tring Museum, collected by Lord Rothschild and Dr. K. Jordan.

13. **Angerona prunaria turbata** subsp.n.

♂, 48–58 mm.; ♀, 58–74 mm. On an average larger than *p. prunaria* Linn. Ground-colour similar, or only very slightly less warm; strigulation stronger, with the strigulae in part long; cell-marks in general narrower, in the ♀—especially on the hindwing—often shortened or even obsolete; apical or terminal dark streak of forewing nearly always obsolete.

Japan, from Tesio to Yokohama; type ♂ from Asamayama, 18 July 1898, in coll. Tring Mus.

14. **Deuteronomos fuscantaria algeriensis** subsp.n.

♂, 35–37 mm. Similar to some of the small, pale S. European aberrations of *f. fuscantaria* Haw. with weak distal cloudings and little-darkened hindwing beneath, but with the lines of the forewing more widely separated and parallel in posterior part, the postmedian only in one example with the posterior curve inward of normal *fuscantaria*, in the other two examples almost meeting the first line of the hindwing, which is visible above; second line of hindwing crossing the cell-spot.

Algeria: N. side of Mt. Zaccar (Miliano), 5 August 1910, the type, and 3 August 1910 (V. Faroult); Sebdou, Oran, 6 July 1918 (P. Rotrou); all in coll. Tring Mus.

Although the differences from some forms of this variable species are slight, the general impression is so different as to warrant the belief that we are dealing with a local race. In any case they are so very distinct from the name-typical British race that it is impossible to merge them under a common designation. The venation is, as usual in *Deuteronomos*, variable; in the type, SC^1 and SC^2 are very shortly stalked, the former anastomosing strongly with C, the latter (which is proximally slender) anastomosing slightly with C before the separation of SC^1 therefrom; in the others SC^1 and SC^2 arise separately and SC^1 anastomoses at a point or minute bar (topotype) or more strongly (Sebdou example) with C and with SC^2.

15. **Deuteronomos infidelis** sp.n.

♀, 46–48 mm. Nearest to *erosaria* Schiff. Larger. Antennal pectinations rather less rudimentary.——*Forewing* appreciably narrower, termen excavated between apex and R^2, the prong broadened (embracing R^2 and R^3), the excavation between R^3 and M^2 deepened; R^3–M^1 well stalked (their stalk about 2 mm. long); the lines rather heavy, somewhat less approximated than in normal *erosaria*, the antemedian more acutely angled near costa; an extensive apical region suffused with vinaceous-fawn and more or less strongly dark-irrorated. ——*Hindwing* with the tooth at R^3 rather long; SC^2–R^1 stalked (their stalk at least 2 mm. long); the line (except costally) better expressed than in most *erosaria*, more oblique, well curved behind R^2; irroration moderate (type) or

traceable (paratype).——Underside with the irroration coarse or strigulate; lines of forewing rather strong, that of hindwing lost posteriorly but continued to costa, oblique inward in front of C.

Amur: Chabarovsk, 22 July (type) and 14 July (paratype) 1910 (E. Borsow), both in coll. Tring Mus.

16. **Deuteronomos lissochila** sp.n.

♂, 35 mm. In essential structure entirely conformable to the already known species. In its small size, weak markings, and whitish edging to the true lines nearest to *quercaria* Hb. Termen of both wings almost smooth, only with faint sinuosity which results in a scarcely noticeable prominence at R^3. ——*Forewing* with the long stalk of $SC^{1,2}$ anastomosing slightly with C, DC deeply incurved, M^1 connate with R^3; colour nearly as in *quercaria*, or slightly more greyish; markings much as in the weakest-marked aberrations of that species, the lines being scarcely darkened except at costa; their course scarcely so parallel as in most *quercaria*.——*Hindwing* beneath with the pale line just distal to the small cell-dot.

Cyprus: Platres, 4,000 feet, 30 July 1916 (G. F. Wilson). Type in coll. Tring Mus.

The type is unfortunately worn, but the species is extremely distinct in shape and cannot fail to be recognized. I have seen other examples, collected on Cyprus by Capt. K. J. Hayward, but they are no longer accessible to me; my note states that they were "very grey," as compared with the ordinary coloration of *Deuteronomos*.

17. **Eumera mulier** sp.n.

♀, 49 mm. Head and body concolorous with wings; the face, except at its edges, mixed with a yellowish shade akin to that of the face of *regina* Stgr. (1892). Antennal pectinations about as in *regina* ♀ or scarcely so long (only a short proximal part of each remains intact).

Forewing broader than in *regina*, apex similarly produced, termen less waved than in even the ♀ of *regina* and less oblique behind the slight bulge; SC^1 connate with SC^2 (probably an individual aberration), connected by a bar with C, SC^2 anastomosing at a point with SC^1 and with $SC^{3,4}$; almost unicolorous vinaceous cinnamon, faintly mixed with olive-yellowish at costa; antemedian line faint, apparently as in the most oblique-marked *regina*; postmedian olive-grey, placed rather nearer the termen than in *regina*, definitely curved in its anterior part (4·5 mm. from termen at R^3, just over 5 mm. at costal margin); a pale line accompanying the postmedian distally, recalling that of *Colotois pennaria* (Linn.) but rather more buff; fringe rather deeper red, with a pale line proximally and white tips.——*Hindwing* with the terminal teeth slighter than in *regina*, that at R^3 scarcely stronger than the others; pale anteriorly, otherwise concolorous with forewing; postmedian line indicated in posterior half; fringe nearly as on forewing.

Underside rather paler, both wings becoming whitish behind fold; postmedian line of forewing reproduced, but darker grey, on the veins almost black; that of hindwing scarcely indicated, but closely followed distally by a curved series (continued at C) of dark grey vein-dots; fringes nearly as above.

Cyprus: Nicosia (J. A. Bucknill), 1 ♀ in coll. Tring Mus.